UNIVERSITY AND EDUCATIONAL NEWS

THE late Sir Samuel McCaughey has bequeathed $2,000,000 to the University of Sydney and $1,250,000 to the University of Brisbane.

DR. G. MCPHAIL SMITH, formerly of the University of Illinois, has been appointed head of the inorganic division of chemistry at the University of Washington, Seattle.

DR. ROBERT GESELL, of the department of physiology in the Washington University Medical School, St. Louis, has been appointed professor of physiology in the University of California.

DR. H. I. COLE, who served overseas as captain in the U. S. Chemical Warfare Service, and was lately associated with the Arthur D. Little Corporation as chemical microscopist, has accepted the appointment of professor of chemistry at the University of Oregon during the absence of Professor Stafford who will be engaged during the coming year in private research in the east.

DR. HIRAM BYRD, formerly scientific secretary of the State Board of Health, of Florida, has accepted the directorship of the Department of Hygiene in the University and the Interdepartmental Board of Social Hygiene.

PROFESSOR BOHUMIL SHIMEK, head of the department of botany in the State University of Iowa, requested last spring that he be relieved of administrative work and much of his teaching in order that he might concentrate on his research. Dr. Robert B. Wylie, professor of morphological botany, was then made head of the department. These changes have been effective for the present academic year.

THE following appointments have been made on the Faculty of the Marquette School of Medicine: Fred T. Rogers, Ph.D., formerly assistant professor in the department of physiology, University of Chicago, professor and director of the department of physiology; Otto F. Kampmeyer, Ph.D., formerly connected with the University of Illinois, associate professor of anatomy; Albert J. Bruecken, M.D., formerly pathologist and bacteriologist in Mercy Hospital, Pittsburgh, and demonstrator of pathology at the University of Pittsburgh, junior professor of bacteriology; S. C. Henn, Jr., M.S., formerly fellow in the department of physiology, University of Chicago, instructor of physiology, and John Tilleman, A.B., assistant, in the department of pathology.

B. M. JONES, Emmanuel College, has been elected to the Francis Mond professorship of Aeronautical Engineering at the University of Cambridge, founded by Mr. Emile Mond in memory of his son, who was killed in the war. Mr. Jones obtained honors in the mechanical sciences Tripos of 1909, and from 1919 to 1912 he was employed on aeronautical research at the National Physical Laboratory. During the war he became assistant controller of experiment and research in the Armament Experimental Station with the rank of lieutenant-colonel.

DISCUSSION AND CORRESPONDENCE

UNIFORMITY IN SYMBOLS

THE hapless student beginning work in aerography and aeronautical engineering, today, may well sympathize with the writer in SCIENCE,[1] who two years ago expressed the wish that some uniform set of symbols might be used. He spoke as a sorely tired reader of recent contributions in meteorology, astronomy and geodesy. His closing appeal was *"Don't let details smother uniformity. Make a start."*

Up to the present time the number of those starting is not impressive, and although we do not want to rush in where angels (?) fear to tread, we venture now to offer a tentative set of symbols for the guidance of those who contemplate work in aerography and allied subjects.

That the perplexity is a real one will appear when we mention that in a recent memoir on dynamic meteorology the letter γ has three different meanings, viz: ratio of specific heats, gravity and temperature gradient. Some

[1] Dr. Otto Klotz, SCIENCE, Vol. XLVI., No. 1189, p. 360, October 12, 1917.

writers, especially the English, use this same symbol for the gradient wind. So too with λ. In astronomy it indicates longitude, in physics, wave-length; but some recent writers on meteorology and aeronautics use it for latitude.

Again, in tracing the development of a formula, one will meet for atmospheric pressure, p, b, P, B, h and H used indiscriminately; v for volume, velocity or radiation; s may be space or seconds; t time or temperature; and R may be a gas constant or the radius of the earth.

We therefore venture to make the start by proposing the following which it is thought conform to the best and latest usage.

ϕ = latitude.
λ = longitude.
π = 3.1416.
e = base nat. logs. 2.718.
ω = angular velocity of earth's rotation.
$= 2\pi/86{,}164$ sec. $= .00007292$.
κ = ratio of specific heats, constant pressure to constant volume.
$\kappa_1 = k$ for air $= .2375/.1683 = 1.41$.
k for water vapor $= .4734/.3631 = 1.30$.
C_{p_A} = specific heat dry air at constant pressure, in heat units .2375.
C_{v_A} = specific heat dry air at present volume, in heat units .1683.
C_p = specific heat dry air at constant pressure in grav. force 9935787.
C_v = specific heat dry air at constant volume in grav. force 7065453.
ρ = density.
ρ_1 = density of water at standard conditions $= 1$.
ρ_2 = density of dry air at pressure 1,000 kilobars and temperature, 1,000 kilograd 1,276 gms./cu. m.
ρ_3 = density of water vapor pressure 1,000 kilograd = 5 gms./cu. m.
g_o = acceleration due to gravity at 45 latitude and sea-level, 980.615 cm./sec^2.
g_v = gravity potential $= g_o/1{,}000z$.
$\frac{dg_o}{z}$ = normal gravity decrease with altitude = .0003086 dynes/meter.
b = bar or unit of pressure expressed in force = 1 dyne/cm.^{2}.
kb = kilobar or 1,000 bars, the pressure unit commonly used.
mb = millibar or 1/1,000 bar.
mgb = megabar or one million bars. This pressure is an absolute atmosphere of .987 of the old sea-level atmosphere. It is the pressure given by 750.1 mm. of mercury (29.53 inches).
One megabar atmosphere acting through one cubic centimeter does one megerg of work.
$1/A$ = mechanical equivalent of heat = 42683.
g_o/A = gravity work of heat = 41,851,000 ergs.
A = heat equivalent of work = .000023.
A/g_o = heat equivalent of gravity work = .000000023.
v = volume; m_s = mass; l = length; $vel.$ = velocity; z = vertical distance; p = pressure.
r = radius; s = second; m = meter; m/s = meters per second.
R = gas constant, which is not a constant in the atmosphere, for there is circulation and gain or loss of heat. The student should question all equations in atmospherics in which it is assumed that the gas coefficient is a constant.
R = 2,870,000 if pressure is in bars.
T_F = temperature on the Fahrenheit scale. Freezing 32°; boiling 212°.
T_C = temperature on the Centigrade scale. Freezing 0°; boiling 100°.
T_A = temperature on the Absolute Centigrade. Freezing 273°; boiling 373°.
T_K = temperature on the Kilograd. Freezing 1,000°; boiling 1,366°.
Ratio of scales: 1 degree F. = 2.04 K.
1 degree C. = 3.66 K.
1 degree K. = 0.491 F.
1 degree K. = 0.273 C.
σ = radiation constant $= 5.7 \times 10^{-12}$.
N = Avogadro constant $= 6.06 \times 10^{-23}$.
n_o = number of gas molecules per cu. cm. at 1,000 kbs. pressure and 1,000K. temperature $= 2.705 \times 10^{19}$.
m_h = mass of hydrogen atom $= 1.662 \times 10^{-24}$.
e_l = electron $= 4.774 \times 10^{-10}$.
Q = heat energy; W = external work; U = inner energy.
r_{eq} = earth's radius at equator = 6,378,388 meters (3,963 miles).

Alexander McAdie,
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